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NEW AND LITTLE KNOWN ANTS OF THE GENERA
MACROMISCHA, CROESOMYRMEX AND
ANTILLAEMYRMEX

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No. 8—*New and Little Known Ants of the Genera Macromischa,
Cresomyrmex and Antillamyrmex*¹

BY WILLIAM MORTON WHEELER

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Until recently our knowledge of the neotropical genus *Macromischa*, as defined by Roger in 1863, was rather meager, owing to the fact that all the species are rare or at any rate very local and, with the exception of one species (*M. sallei*), form small colonies, often in situations overlooked by the casual collector. In 1920, Mann, who discovered a number of new and remarkable species and revised the genus, showed that it is much more extensive than previous myrmecologists had supposed. Several collections generously contributed within the past year by Dr. Elisabeth Skwarra, Dr. W. S. Creighton, Dr. J. G. Myers, and especially by Dr. C. G. Aguayo and his assistant Dr. P. Bermudez, of the Museo Poey, Havana, contain some fourteen new forms, which are described in the following pages. I have added a species which I recently found in Florida. With these accessions, the genus, as defined by Roger and emended by Mann, now comprises 54 forms (43 species, 3 subspecies, and 8 varieties). More intensive collecting in the American tropics will, no doubt, reveal the existence of a considerable number of additional species.

In his article of 1863, Roger described seven large and beautiful species — *purpurata*, *porphyritis*, *squamifera*, *iris*, *lugens*, *versicolor*, and *punicans* — from specimens collected by the Nestor of Cuban naturalists, Gundlach. Of these I designated *purpurata* as the genotype of *Macromischa* in 1911, and, in 1913, added two more species, *gundlachi* and *pocyi*, which are represented by single specimens in the Gundlach collection in Havana, and had not been sent to Roger. Of these nine species, known only from descriptions for so many years, seven have been recently recovered in the field, namely, *purpurata* and *squamifera* by Mann, *pocyi* by Brunner and Ballou, *versicolor* by Creighton, *porphyritis* by Bermudez, and *iris* and *lugens* by Aguayo. *Gundlachi* and *punicans*, therefore, still remain to be recovered. Long after Roger had established his genus, Forel found that *Myrmica sallei*, described by Guérin-Méneville in 1852 from Santo Domingo, is a true *Macromischa*. Other species of the genus have been added from time to time by Emery, Forel, Mann, Menozzi, and myself.

Emery, in a short paper published in 1896, recognized only eight valid species of *Macromischa*, six described by Roger and two by himself (*pastinifera* and *pulchella*). *M. cressoni*, described by Ernest André from Mexico in 1887, and Roger's *punicans* he withdrew from the genus, regarding them both in 1896 as belonging to the genus *Aphaenogaster*, and in 1915 as being merely minor workers of *Pheidole*. To this interpretation he adhered in the "Genera Insectorum" (1921). He was undoubtedly correct in regard to André's species, of which he had examined a cotype, but as I shall show on page 29, he was certainly wrong in regard to *punicans*, which he knew only from Roger's description.

Roger's seven species were so diverse that he emphasized the heterogeneous character of the genus. In 1930, Mann in his revision divided the genus into three subgenera, namely: *Macromischa sens. str.*, comprising the species with epinotal spines and long petiolar peduncle; *Croesomyrmex* with unarmed epinotum; and *Antillaemyrmex*, comprising small, terricolous species, with epinotal spines, but with short petiolar peduncle. At the present time it seems preferable to regard *Croesomyrmex* and *Antillaemyrmex* as distinct genera. The status of the latter, however, is somewhat doubtful, because at least one species of *Macromischa sens. str.*, namely *pastinifera* Emery, is terricolous, according to Creighton, and one species of *Antillaemyrmex* (*floridanus*) lives in twigs, and because the species *melanocephala*, described below, is very much like an *Antillaemyrmex*, except in the shape of the petiole. Perhaps the males may be useful in defining these genera more accurately, but as yet no male *Antillaemyrmex* is known.

The geographical distribution of the three genera is peculiar and concentrically overlapping. *Macromischa sens. str.* has the widest range, including the Bahamas, Greater Antilles, and the North American continent from Panama to central Texas. No species, however, are known to occur in Jamaica or the Windward Islands. *Antillaemyrmex* is less widely distributed, being confined to the West Indies (Bahamas, Cuba, Haiti and Santo Domingo, the Virgin Islands) and to Florida. *Croesomyrmex* is known only from Cuba.

The habits of the species of the three genera are remarkably diverse. We now possess notes on the nidification of some twenty-nine species. In the following list, the first observer of the nesting habits is cited in parenthesis:

- (1) Making ovoidal carton nests on trees: *Macromischa sallei* (Guérin), subsp. *haytiana* (Mann).

- (2) Nesting between the leaves or among the roots of epiphytic Tillandsias, or among the roots of epiphytic orchids: *M. petiolata* (Wheeler); *isabellae* (Wheeler); *purpurata* (Mann); *skwarrae* sp. nov. (Skwarra); *flavitaris* (Skwarra); *annectens* (Skwarra).
- (3) Nesting in hollow twigs of trees or shrubs: *M. flavitaris* (Wheeler, Skwarra); *fusca* (Wheeler); *isabellae* (Wheeler); *purpurata* (Mann); *azteca* sp. nov. (Skwarra); *Antillaemyrmex floridanus* sp. nov. (Wheeler).
- (4) Nesting in dead twigs on the ground: *M. squamifera* (Mann).
- (5) Nesting in the hollow stems of sedges: *M. splendens* (Wheeler); *allardycei* (Mann).
- (6) Nesting in bark, dead or decaying wood: *M. subditiva* (Wheeler); *flavitaris* (Wheeler); *affinis* (Mann).
- (7) Living in crevices of limestone rocks or cliffs, often with more or less tubular carton entrance: *M. creightoni* (Creighton); *myersi* sp. nov. (Creighton); *manni* sp. nov. (Creighton); *porphyritis* (Aguayo); *Croesomyrmex wheeleri* (Mann); *versicolor* (Creighton); *lugens* (Aguayo); *aguayoi* sp. nov. (Aguayo); *poeyi* (Aguayo), and probably also *bermudezi* sp. nov.
- (8) Nesting in soil under stones or leaves: *M. pastinifera* (Creighton); *Antillaemyrmex albispina* (Wheeler); *terricola* (Mann); *flavidula* (Mann).

No less remarkable than this diversity of nidification is the extraordinary diversity of coloration in the species of *Macromischa* and *Croesomyrmex*. They not only exhibit nearly the whole gamut of insect colors from yellow through testaceous, ferruginous, red, brown, and black to metallic green, blue, violet, and purple, but these colors are often so peculiarly distributed on the body and appendages as to suggest some ethological significance in the lives of the insects. The metallic, or most highly evolved type of coloration, occurs only among the Cuban and Bahaman species of *Macromischa* and in *Croesomyrmex*. The continental species of the former genus and all the species of *Antillaemyrmex* have merely a yellow, red, or black coloration, like the great majority of Formicidae.

The peculiar, very largely West Indian distribution of the three closely related genera, *Macromischa*, *Croesomyrmex*, and *Antillaemyrmex* suggests a consideration of their possible phylogenetic and geological history. Emery and Mayr at one time believed that the genus *Macromischa* was also represented in the Old World. The latter described two species, *M. aculeatus* and *africanus* from the Ethiopian

region, but Emery later relegated them to the genus *Tetramorium*. In 1922, I placed them in a new genus, *Macromischoides*. The workers of these species closely resemble *Macromischa sens. str.* and build carton nests somewhat like those of *Macromischa sallei*, but the males have 10-11 instead of 13-jointed antennae and lack the notauli on the mesonotum. More recently (1924) Santschi, though accepting the genus *Macromischoides* as valid, has placed it in the tribe *Tetramorii*. Its affinities to *Macromischa* are, therefore, remote, because the latter is by common consent most closely related to *Leptothorax* and is even cited by Emery in the "Genera Insectorum" (1924) as the first genus of his tribe *Leptothoracini*.

Macromischa also closely resembles one of the Old World groups of species in the genus *Leptothorax*. This group, represented by some eight species and a number of subspecies and varieties, is characterized by an elongate petiolar peduncle and a rounded or depressed petiolar node as in *Macromischa*, and has a rather singular distribution, comprising the Canary Islands, Morocco, Oran, Algiers, Tunis, Sardinia, Sicily, Italy, the Balkan peninsula, Palestine, Syria and Abyssinia. Four of the eight species occur in the Canary Islands and of these, two have subspecies in Morocco. One highly variable form, *L. rottenbergi*, regarded as the type of the group, was actually described by Emery as a *Macromischa*. It has a wide distribution over the area above mentioned. This *rottenbergi* group seems, indeed, to be quite distinct from the other groups of *Leptothorax*. The species are larger and some of them exhibit a more vivid coloration, in both of which characters they approach *Macromischa*. Concerning the center of distribution of the group, Santschi (1909) says: "This group is unequally distributed throughout the shores of the Mediterranean, the west coast of Morocco, and the Canaries, but it is in these two latter regions that it presents the greatest number of species and varieties. These regions, therefore, may be regarded as the cradle of the group, whence it has radiated toward the east and perhaps towards the south as far as Senegal."

When we turn to the palaeontological data we find that species of the *rottenbergi* group of *Leptothorax* actually ranged as far north as the Baltic region during the Early Tertiary. Mayr (1868) in his admirable monograph on the ants of the Baltic amber described three species of *Macromischa* (*rudis*, *rugosostriata*, and *petiolata*) and Ernest André later referred a fourth species (*prisca*), somewhat doubtfully, to the same genus. In my revision (1914) of these fossils, I assigned André's species provisionally to the oriental genus *Vollenhovia* and Mayr's three species to a new genus, *Nothomyrmica*. But Emery (1921) has not

accepted this interpretation. He regards Mayr's *rugosostriata* and *petiolata* as belonging to the *rottenbergi* group of Leptothorax, and *rudis* Mayr and *intermedia* Wheeler as representing some other Leptothorax group with dubious affinities. Reëxamination of my figures and descriptions leads me to accept Emery's interpretation. Especially, the allocation of *rugosostriata* in the *rottenbergi* group seems to me to admit of no doubt.

We may assume, therefore, that the nearest allies of *Macromischa* were already developed in northern Europe as early as the Lower Oligocene, and we may derive the Antillean genera *Macromischa*, *Croesomyrmex*, and *Antillaemyrmex* from some offshoot of the circumpolar genus *Leptothorax*, a large and heterogeneous complex which has also given rise to the present almost entirely continental neotropical subgenus *Goniothorax*. There is an alternative interpretation, however, namely, that the three neotropical genera *Macromischa*, *Croesomyrmex*, and *Antillaemyrmex* are directly derived from the *rottenbergi* group of *Leptothorax*, but this would necessitate a resort either to a hypothetical sunken land-bridge between the Mediterranean region and the Antilles, as suggested by Scharff, or to an early geological apposition of the Antillean region and northwest Africa, as postulated by Wegener.

MACROMISCHA SALLEI (Guérin) subsp.

OPACINODA subsp. nov.

Worker.—Length 3.5–4.5 mm.

Somewhat smaller and more slender than the typical *sallei* and of the same stature as the subspecies *haytiana* Wheeler and Mann, but differing from this form as follows: epinotal spines shorter and seen from above somewhat curved inward, longitudinal rugae of the head more distinct, thoracic rugosity much finer, less longitudinal and distinctly vermiculate. Petiolar node narrower anteriorly and in profile less rounded; like the postpetiolar node, not shining but opaque or subopaque and regularly reticulate. Head and thorax ferruginous, the former scarcely paler than the latter; petiolar peduncle deep ferruginous, its node and that of the postpetiole dark brown; gaster black, with reddish tip; legs brownish ferruginous, slightly darker than the head and thorax, tarsi paler and more reddish. Antennae ferruginous, paler at the base, the clubs blackish.

Described from numerous specimens taken by Mr. W. T. Eyerdam at Grand Cayamite, Haiti, running on the trunk of a tree.

MACROMISCHA AZTECA sp. nov.

Worker.—Length 2.6–3 mm.

Head subrectangular, very nearly as broad as long, with subparallel sides, broadly rounded posterior corners and feebly convex posterior border. Eyes rather convex, at the middle of the sides. Mandibles large, 5-toothed, with convex external borders. Clypeus convex in the middle, depressed at the sides, with broadly rounded, entire anterior border. Frontal area indistinct. Antennal scapes surpassing the posterior border of the head by nearly three times their greatest diameter; first funicular joint nearly as long as the four succeeding joints together, joint 2 distinctly longer than broad, 3–8 subequal, as broad as long; club long, 3-jointed, the two basal joints fully $1\frac{1}{2}$ times as long as broad, together equal to the somewhat thicker apical joint. Thorax rather long, broader through the pronotum; the meso- and epinotum parallel-sided; in profile the dorsal outline is straight except for a faint but distinct transverse impression between the meso- and epinotum. Base of epinotum longer than the abrupt, concave declivity; spines as long as the declivity, directed backward and outward and slightly deflected. Petiolar peduncle as long as the node, armed anteroventrally with a slender, downwardly directed spine; node rising rather abruptly from the peduncle, broader than long, anteroposteriorly compressed, with straight, blunt, transverse superior border, the sides straight and converging below. Postpetiole strongly convex anteriorly, from above small, nearly square, slightly narrower anteriorly and distinctly narrower than the superior border of the petiolar node. Gaster of the usual shape; sting long. Legs rather long, tibiae and median portions of the femora distinctly swollen.

Mandibles shining, striate. Head and thorax almost opaque, finely punctate, the head and clypeus also longitudinally rugulose. Thorax above irregularly rugulose, the sides of the pronotum more longitudinally, the epinotal declivity transversely rugulose. Nodes of petiole and postpetiole smooth and shining, their sides and the peduncle of the former punctate and more opaque. Gaster smooth and shining. Antennal scapes subopaque, densely punctate; legs more shining and more densely punctate. Hairs white, bristly, pointed, of uneven length, erect on the body and somewhat sparser than on the appendages, where they are more oblique.

Yellowish ferruginous; mandibles, clypeus, cheeks, gaster and legs somewhat paler and more yellow; teeth and borders of mandibles,

antennal clubs, knees, posterior tibiae and posterior borders of gastric segments brown.

Female (decalated). Length 4 mm.

Resembling the worker except in the shape and sculpture of the thorax. Mesonotum large, flattened above, as broad as long; epinotal spines stout, shorter than their distance apart at the base. Pronotum transversely, mesonotum and scutellum longitudinally, and epinotum irregularly rugulose. Color like that of the worker but with the wing insertions, epinotal spines, petiolar and postpetiolar nodes, femora and tibiae of the middle and hind legs, a broad band at the posterior end of each gastric segment and along the sides of the first, dark brown or blackish. Petiolar peduncle pale yellow; mandibular teeth black. Pilosity on the body more uniform and somewhat more abundant than in the worker.

Male.—Length 2.3–2.5 mm.

Head as broad as long, prolonged and rounded behind the large, prominent eyes, without posterior corners, cheeks very short. Ocelli large, prominent. Mandibles well developed, 4-toothed, with convex external borders. Clypeus very convex in the middle, with straight, transverse anterior border. Antennal scapes short, only four times as long as broad; funiculi long, first joint elongate, swollen; joints 2–7 more slender, subequal, about $1\frac{1}{2}$ times as long as broad; club 4-jointed, the three basal joints subequal, twice as long as broad, the terminal joint as long as the two preceding together. Mesonotum and scutellum shaped much as in the female, the former with distinct but shallow notauli (Mayrian furrows), the epinotum small, unarmed, rectangular in profile, with subequal base and declivity, the former distinctly concave anteriorly. Petiole with thick peduncle, the node in profile low, rising very gradually from the peduncle and only half as long as the segment, seen from above narrow, with straight, transverse superior border. Postpetiole rectangular as in the worker but broader than the petiolar node. Gaster like that of the worker, genitalia prominent. Wings rather short.

Mandibles shining, finely and indistinctly punctate; head opaque, densely and more coarsely punctate; clypeus and sides of front also longitudinally rugulose. Thorax punctate like the head but less densely, so that the surface is more shining, especially on the sides. Remainder of the body smooth and shining, with fine, sparse, piligerous punctures.

Pilosity pale, much finer, shorter and sparser than in the worker and female, and more nearly appressed on the appendages.

Black; mandibles yellowish, with brown teeth; clypeus dark brown; antennae, legs and genitalia pale brown, tarsi paler. Wings whitish hyaline, with very pale brownish veins and stigma.

Described from a number of workers and males and a single female found by Dr. Elisabeth Skwarra nesting in hollow twigs at Mirador, Mexico. This species somewhat resembles *M. affinis* Mann of Cuba, but is smaller, with shorter epinotal spines, differently shaped petiole and postpetiole, different coloration, etc.

MACROMISCHA SKWARRAE sp. nov.

Worker.—Length 2.6–3.2 mm.

Head subrectangular, slightly longer than broad, as broad in front as behind, its posterior border slightly concave. Eyes moderately large and convex, at the middle of the sides. Mandibles stout and rather broad, with five subequal teeth and rather straight external borders. Clypeus convex, its anterior border broadly rounded and projecting. Frontal area distinct but not impressed. Antennal scapes reaching very nearly to the posterior border of the head; first funicular joint as long as the three succeeding joints together; joints 2–8 as broad as long; club 3-jointed, its two basal joints together somewhat shorter than the more enlarged terminal joint. Thorax rather long, broader through the pronotum, its dorsal profile straight except for a very feeble impression between the meso- and epinotum; base of the latter rounded in profile and nearly twice as long as the sloping concave declivity, armed with two small, blunt, approximated spines, which are somewhat longer than the distance between their bases and directed upward, backward and outward; metasterna large, bluntly angular and turned upward. Petiole rather short, with robust peduncle, armed with a small anteroventral tooth; node low, its anterior surface rising gradually from the peduncle, its posterior surface convex and descending more abruptly to a pronounced constriction of the petiole. Seen from above the node is laterally compressed and but little broader than the peduncle. Postpetiole campanulate, fully $2\frac{1}{2}$ times as broad as the petiole, as long as broad, narrowed and evenly rounded anteriorly, posteriorly with subparallel sides. Gaster lenticular, somewhat flattened dorsoventrally, with straight anterior border. Legs long, femora, especially the hind pair, greatly incrassated.

Mandibles, head, thorax, pedicel, antennae and tibiae opaque, gaster and femora somewhat shining, or lustrous. Mandibles coarsely striate, head, thorax and pedicel densely punctate, clypeus and head

also longitudinally rugulose, thorax covered with more undulating and irregular rugae, which are somewhat less distinctly longitudinal. Gaster and legs finely and densely reticulate.

Hairs on the body white, short, obtuse, erect and rather sparse, mostly on the dorsal surface; short, acute and appressed on the appendages.

Head, scapes, thorax, petiole and postpetiole deep black; gaster dull yellow with a dark brown band at the posterior border of the first segment. Antennal funiculi, mandibles and legs dark brown, almost black.

Female (deälated). Length 5 mm.

Resembling the worker in sculpture, pilosity and color, but the sculpture of the thorax is stronger and more regular, the pronotum and epinotal declivity being transversely, the mesonotum, scutellum and pleurae longitudinally rugulose. Mesonotum as broad as long, flattened above; base and declivity subequal, the latter vertical, the spines in the form of dorsoventrally compressed lobes, less than twice as long as broad, directed backward. Petiole irregularly rugulose; postpetiole fully $1\frac{1}{2}$ times as broad as long, above finely, longitudinally rugulose. Gaster suboblong, more reddish yellow than in the worker, with dark brown bands at the posterior borders of the segments, the one on the first segment being more than twice as broad as the others.

Described from several workers and a single female taken by Dr. Elisabeth Skwarra in an epiphyte (*Tillandsia circinnata*) at Cuernavaca, Morelos, Mexico. This beautiful species is very easily recognized and very unlike the other continental species. It resembles *M. isabellae* Wheeler of Porto Rico in the shape of the thorax and petiole, but is very different in sculpture and coloration.

MACROMISCHA ANNECTENS sp. nov.

Worker.—Length about 3.7 mm.

Head subrectangular, slightly broader behind than in front, with broadly rounded posterior corners and nearly straight posterior border. Eyes moderately large and convex, at the middle of the sides. Mandibles rather small and flat, with a large apical and four smaller basal teeth. Clypeus short, convex in the middle behind, its anterior border sinuate in the middle and on each side so that it appears somewhat bilobed. Frontal area triangular, rather indistinct. Frontal carinae short, diverging posteriorly. Antennal scapes reaching to the posterior corners of the head; first funicular joint as long as the three succeeding

joints together; joints 2-7 small, broader than long, 8 as long as broad; the three terminal joints forming a very distinct club, as long as the remainder of the funiculus and with the two basal joints subequal and together shorter than the last joint. Thorax long and narrow, fully three times as long as broad, somewhat broader through the pronotum than through the parallel-sided mesoëpinotum; pleurae flattened; dorsal surface in profile nearly straight and horizontal, without mesoëpinotal impression; base and declivity of epinotum subequal, the latter perpendicular and concave; the spines stout at the base, laterally compressed, with blunt tips, longer than their distance apart at the base, but shorter than the epinotal declivity, directed backward and outward and very slightly curved downward. Peduncle of petiole with a minute anteroventral tooth, nearly as long as the node, which is somewhat cuboidal and constricted behind, in profile with steeply sloping anterior, horizontal superior and perpendicular posterior surface; seen from above, it is as long as broad, semicircularly rounded anteriorly, with straight posterior border. Postpetiole $1\frac{3}{4}$ times as broad as the petiolar node and about $1\frac{1}{2}$ times as broad as long, rounded-trapezoidal, slightly broader behind than in front, convex and rounded above. Gaster rather large, broadly elliptical, first segment with truncated, nearly straight anterior border; sting long. Legs stout; all the femora, and especially the hind pair, conspicuously incrassated in the middle.

Opaque; venter, coxae, legs and antennal scapes feebly shining, or glossy. Mandibles finely longitudinally striated. Clypeus longitudinally rugulose, most distinctly on the sides. Head densely punctate above, longitudinally reticulate-rugose, its sides and the sides of the thorax merely reticulate-rugose, the dorsal surface of the latter longitudinally but more vermiculately rugose, the pronotum much more coarsely than the mesoëpinotum. Epinotal declivity smooth but dull. Petiolar node indistinctly reticulate-rugose above, postpetiole coarsely and densely, and dorsal surface of first gastric segment more distinctly, scapes and legs more finely and indistinctly reticulate or shagreened.

Hairs on the body yellowish, short, stout and obtuse (as in *Leptothorax*), not very abundant and confined largely to the dorsal surface; pubescence very short and appressed, distinct on the antennae, almost absent on the legs.

Ferruginous red; mandibles, antennae, coxae, legs, petiolar peduncle and terminal gastric segments paler, dull ferruginous yellow; first gastric segment with a poorly defined dark brown fascia posteriorly. Mandibular teeth black.

Described from three specimens taken by Dr. Skwarra at Cuernavaca, Morelos, Mexico, nesting in an air-plant, *Tillandsia circinnata*.

This singular ant somewhat resembles *M. azteca* and *salvini* Forel, but is really very different. In habitus it is so much like certain species of *Leptothorax*, especially those of the *rottenbergi* group, that I should have placed it in that genus but for its more conspicuously incrassated femora.

MACROMISCHA PETIOLATA (Forel)

This form was originally described as a *Leptothorax* and based on specimens from a single colony which I took many years ago at Cuernavaca, Morelos, Mexico, nesting in an epiphyte (*Tillandsia*), which also contained colonies of two other ants belonging to the genera *Cryptocerus* and *Crematogaster*. Forel suggested that the species might be a *Macromischa*, and Emery in the "Genera Insectorum" has recently transferred it to that genus. This allocation is undoubtedly correct.

The dealated female (undescribed) of the colony is still in my collection. It measures 4 mm. and has a broader head than the worker, as broad as long and distinctly narrower in front than behind. Thorax only about twice as long as broad, with large mesonotum, which is as broad as long, semicircular anteriorly and flattened above. Scutellum large and flattened, as long as the epinotum which has a sloping base and vertical declivity; spines very short and blunt, less than twice as long as their basal diameter and shorter than their distance apart. Petiolar node higher, more cuboidal and more distinctly marked off from the peduncle than in the worker. Postpetiole transversely subrectangular, fully twice as broad as long. Gaster large, elliptical, with concave anterior border. Sculpture like that of the worker, but the head, mesonotum and scutellum finely and sharply longitudinally rugulose; metasterna and bases of epinotal spines more coarsely rugulose. Pilosity and coloration as in the worker.

MACROMISCHA FLAVITARSIS Mann

A number of workers, females and males were taken by Dr. Elisabeth Skwarra from several colonies at Mirador, Mexico. One of these was nesting in a thorn of *Acacia cornigera*, the others in the stems of a Melastomaceous shrub, *Conostegia xalapensis*. Females and workers

from another colony taken at Tlacocintlo were nesting in a *Tillandsia pruinosa*. The workers and females agree closely with the types which I collected in hollow twigs in the highlands of Guatemala. The tibiae of the workers are more or less whitish, like the tarsi, at the base, and the tips of the epinotal spines are of the same color. Mann failed to notice that the head of the female is longitudinally rugose like the mesonotum. The tibiae are yellowish or whitish clouded with fuscous. The wings are white, with very pale veins and stigma. Dr. Skwarra's material contains two ergatomorphic females, which are somewhat smaller than the worker, wingless, but with a typical female thorax. The head and mesonotum, however, are smooth and shining as in the worker. The head is shaped like that of the worker but has more prominent eyes, distinct ocelli, and shorter antennal scapes.

Male (undescribed). Length 2.3 mm.

Head as broad as long, with large convex eyes, well developed cheeks, the postocular portion large, distinctly swollen on each side just behind the eyes and projecting backward as a blunt pyramid bearing the moderately large and widely separated ocelli. Clypeus narrow, convex, with rounded, projecting anterior border. Mandibles small, with two distinct apical and two indistinct basal teeth. Antennae with long scapes as in the worker; first funicular joint elongate, swollen; all the remaining joints longer than broad; the club 4-jointed, not sharply marked off from the remainder of the funiculus. Thorax short, mesonotum convex anteriorly, with well developed notauli; mesosterna swollen. Epinotum unarmed, in profile with distinct, subequal base and declivity meeting at an obtuse angle. Petiole with a low node rising gradually from the short, slender peduncle; seen from above, the node is pyriform and as broad as long. Postpetiole transversely elliptical, twice as broad as long and much broader than the petiolar node. Gaster elliptical with truncated base and prominent, exerted genitalia. Legs slender, wings small.

Mandibles, nodes of pedicel and gaster smooth and shining; head, thorax and ventral portions of pedicel subopaque, finely and densely punctate.

Pilosity somewhat as in the worker and female, but the rigid, erect hairs on the dorsal surface are shorter and more delicate.

Black; appendages pale brown or whitish; antennal clubs and femora, except their bases and tips, infuscated; tibiae more feebly infuscated in the middle. Wings pale, whitish, with colorless veins and stigma.

MACROMISCHA SUBTIVA Wheeler

This Texas species closely resembles *M. flavitarsis* Mann and *laevissima* Wheeler of Mexico, but is paler, reddish brown, with shorter and less curved epinotal spines, the petiolar node is broader above with more transverse superior border and sharper lateral corners. Surface of head less smooth and shining, being throughout finely longitudinally rugulose and the thorax smooth, shining and free from sculpture only in the mid-dorsal region of the pronotum.

I have taken this species nesting, like certain species of *Leptothorax*, in the bark of large trees (willows) at Austin, Del Valle, and New Braunfels, Texas, and have specimens taken by J. A. Mitchell at Victoria and by R. A. Vickery at Harlingen, in the same state. The series from Victoria contains a dealated female which has not been described. It measures 3.5 mm. Head subrectangular, as broad as long, broader behind than in front, with convex posterior border. Thorax less than twice as long as broad, mesonotum nearly as broad as long, flattened above; scutellum nearly as long as the epinotum, which is short, with sloping base and vertical declivity; spines acute, stout at base, shorter than their distance apart. Postpetiole nearly $2\frac{1}{2}$ times as broad as long; gaster large, elliptical, with concave anterior border. Pilosity and coloration as in the worker, head and thorax more opaque, evenly longitudinally rugulose.

MACROMISCHA MELANOCEPHALA sp. nov.

Worker.—Length 1.5–1.8 mm.

Head subrectangular, slightly longer than broad, with broadly rounded posterior corners and convex posterior border. Eyes rather large, at the middle of the sides. Mandibles with two stout apical and three small basal teeth, external borders rather straight. Clypeus large, moderately convex, its anterior border entire, broadly rounded and projecting. Frontal area distinct, triangular, with a median carinula. Frontal carinae short. Antennae stout, scapes reaching slightly beyond the posterior border of the head; first funicular joint as long as the three succeeding joints; joints 2–8 subequal, distinctly broader than long; club very distinct, 3-jointed, its terminal joint large, longer than the two basal joints together. Thorax short and stout, less than twice as long as broad, broad through the humeri of the pronotum, which is very large; meso- and epinotum narrowed posteriorly. In profile the thorax is high with convex, evenly rounded dorsal outline

and rather long, steep, concave epinotal declivity; spines slender, approximated at the base, as long as the declivity, directed upward, backward and outward and somewhat curved downward. Metasterna small and rounded. Petiole short, the peduncle laterally compressed, without anteroventral tooth; node as long as the peduncle from which it rises abruptly, higher and somewhat broader than long, in profile subcuboidal, from above semicircular. Postpetiole broadly campanulate, fully twice as broad as long and twice as broad as the petiolar node. Gaster rather large, suboval, with straight or slightly concave anterior border. Legs rather short, femora, especially the hind pair, distinctly incrassated.

Mandibles, head, thorax and scapes opaque, remainder of the body somewhat shining, or lustrous, the gaster more than the pedicel and legs. Mandibles finely and indistinctly striated; clypeus longitudinally rugulose; head uniformly and densely punctate, the punctures arranged in regular lines separated by very delicate and rather indistinct rugules. Thorax and pedicel much more finely and densely punctate, in some specimens with indications of fine longitudinal striae on the pronotum. Pedicel finely but more superficially punctate. Gaster and legs smoother, superficially reticulate. Scares densely punctulate.

Hairs yellowish, sparse, obtuse and erect on the dorsal surface of the body, fine, pointed and appressed on the appendages.

Clypeus and head black; mandibles, frontal carinae, antennae, thorax and abdomen pale brownish yellow; antennal clubs infuscated; legs and epinotal spines white or very pale yellow.

Female (deilated). Length 2-2.3 mm.

Head more rectangular than in the worker, fully as broad as long. Thorax very broad and robust, the mesonotum subrectangular, flattened and longer than the scutellum and epinotum together. Epinotal spines stout, acute, scarcely longer than their distance apart at the base, directed backward and curved somewhat inward and downward. Sculpture, pilosity and coloration of head, pedicel and appendages as in the worker but the mesopleurae, wing insertions, posterior border of scutellum, metanotum, an anteromedian spot on the mesonotum, and elongate spots on the paraptera, dark brown. Gaster dark brown, with only the anal region and the anterior portion of the first segment, both dorsally and ventrally, brownish yellow.

Described from two females and many workers, constituting a single colony collected at Hacienda Jiqui, Ensenada de Cochinos, Cuba, by Dr. J. G. Myers. They were nesting in a dead twig of mahogany (*Swietenia mahagoni*) lying on the ground. This queer little ant is

quite unlike any other known species of the genus. In thoracic structure it resembles the species of *Antillaemyrmex*, but the petiole is clearly that of a *Macromischa*.

MACROMISCHA PORPHYRITIS Roger

Worker.—Length 4.5–5 mm.

Slender; head suboval, about $\frac{1}{3}$ longer than broad, narrowed behind, with straight posterior border and rather indistinct posterior corners; cheeks rather straight, subparallel. Eyes moderately large and convex, at the middle of the sides. Mandibles narrow, 5-toothed, with rather straight external borders. Clypeus short, convex in the middle, its anterior border feebly sinuate in the middle. Frontal area triangular, distinct, but not deeply impressed. Antennae very slender; scapes reaching fully $\frac{1}{4}$ their length beyond the occipital border; first funicular joint as long as the second and third together, the second distinctly longer than the third, joints 3–7 one and one-half times as long as broad; club rather indistinctly 3-jointed, shorter than the remainder of the funiculus. Thorax long, of uniform width, except for a pronounced lateral constriction between the pro- and mesonotum; dorsal outline in profile straight and horizontal; base of epinotum twice as long as the declivity, with which it forms a right angle; spines long and slender, nearly as long as the base of the epinotum, directed backward and somewhat upward, their bases rather stout, directed outward, backward and somewhat inward; their tips turned upward, so that each spine has a distinct sigmoidal flexure. Metasternal angles very short and blunt. Petiole very long and slender, the peduncle twice as long as the node, distinctly swollen at the spiracles, with a rudimentary anteroventral denticle and a ventral convexity near the middle; node in profile rather low and evenly rounded, longer than high, about twice as long as broad, constricted behind. Postpetiole campanulate, as broad as long, behind nearly twice as broad as the petiole. Gaster slender, its first segment decidedly longer than broad, the remaining segments forming a long, tapering point. Sting well developed. Legs long; femora only slightly incrassated.

Mandibles somewhat shining, coarsely striate-punctate; head and thorax opaque or somewhat lustrous, finely and densely punctate-rugulose, the rugules indistinctly longitudinal on the vertex, pronotum and pleurae, more distinct and transverse on the mesoepinotum. Petiole, postpetiole, gaster and legs rather shining, sparsely and finely punctate; femora sparsely tuberculate; scape opaque, finely punctate-striate.

Hairs white, pointed, abundant, moderately long and erect on the head, thorax and gaster, somewhat shorter and more oblique on the legs; numerous, conspicuous and curved on the scapes.

Mandibles, clypeus and cheeks anteriorly yellowish red; head and thorax deep, dull metallic purple, often with violaceous reflections; petiole, postpetiole and gaster black, with bluish reflections; legs and antennae more piceous or dark brown; terminal tarsal joints more reddish; sting golden yellow.

Described from numerous specimens taken by Dr. P. J. Bermudez in the Sierra del Grillo, Havana Province, Cuba. Dr. Aguayo has also sent me a single worker taken by Dr. Bermudez at Matanzas, which is very near the locality in which Gundlach took Roger's type specimen. This, I feel certain, is the true *porphyritis*. The only point in which it disagrees with Roger's description is the color of the legs which is described as "gelb-braun." Probably the type specimen was immature. The form taken by Creighton at Soledad, near Cienfuegos, and identified by Mann as *porphyritis* is a very similar but distinct species, which is described below as *M. manni* sp. nov.

MACROMISCHA PORPHYRITIS var. LATISPINA var. nov.

Worker. Of the same size and with the same sculpture and pilosity as the typical form of the species, but the head and thorax are dull opaque black, without metallic reflections; the abdomen and appendages also darker and more blackish, the mandibles, clypeus and cheeks more yellowish red as in the type. The basal half of each epinotal spine is conspicuously broader and more laterally compressed, but the dilatation ends rather abruptly at the middle so that the apical half of the spine is thin and tapering and bent downward.

Eleven specimens taken by Dr. C. G. Aguayo at Mena, in the Yurumi Valley, Matanzas, and, therefore, at or very near the type-locality of the true *porphyritis*.

M. PORPHYRITIS var. JAUMEI Santschi

Santschi (1930) described this form from several worker specimens taken by M. Jaume at Ceiba Mocha, Matanzas, as a distinct species, but a cotype specimen kindly sent me by Dr. Aguayo shows that it is really a form of *porphyritis*. The specimen is darker than those described by Santschi, having the head and thorax dull purplish black

instead of deep red. The rugulosity of these parts is distinctly coarser, the petiole and postpetiole less shining. I believe, therefore, that *jaumei* can be only a variety or at most a subspecies of *porphyritis*. Probably Santschi compared his specimens with specimens of *M. manni* which has been erroneously identified as the true *porphyritis*.

MACROMISCHA MANNI sp. nov.

Worker.—Length 5–5.5 mm.

Similar to *porphyritis* but averaging somewhat larger. Head subrectangular, only slightly longer than broad, distinctly broader behind the eyes than in front, with well developed posterior corners, straight posterior border and very feebly convex cheeks. Mandibles 5-toothed, with distinctly convex external borders. Thorax shaped much as in *porphyritis*, but more robust and the dorsum of the mesoëpinotum very feebly convex; epinotal spines also very similar but slightly shorter, with more slender bases and less pronounced sigmoidal flexure. Petiolar peduncle distinctly stouter, the node higher, more broadly rounded in profile and with more sloping anterior declivity. Postpetiole broader than long and more rounded anteriorly than in *porphyritis*. Femora distinctly more thickened in the middle. Sculpture of the head and thorax resembling that of *porphyritis* but the rugae decidedly stronger and the punctuation between them looser and less distinct, so that the surface is not opaque but distinctly shining. Femora more sharply tuberculate.

Pilosity as abundant as in *porphyritis* but more yellowish and on the scapes shorter and more appressed.

Head and thorax ferruginous red, with faint violet reflections; mandibles, clypeus and cheeks paler and more yellowish; petiole reddish yellow, with the node, postpetiole, legs and antennae yellowish brown, with very faint bluish reflections. Gaster black; bases of femora paler and more reddish.

A series of workers and a single dealated female taken by Dr. W. S. Creighton at Soledad, near Cienfuegos, Cuba. The female has been described by Mann as that of *porphyritis*. Dr. Creighton took several colonies of this ant nesting in crevices of limestone. Their entrances consisted of carton composed of silk and vegetable detritus. He describes the foraging workers as walking with the long-peduncled abdomen elevated above the thorax, giving them "a curious appearance somewhat reminiscent of a person carrying a parasol."

MACROMISCHA MYERSI sp. nov.

Worker.—Length 4.5–5 mm.

Head subrectangular, somewhat longer than broad, with broadly rounded posterior corners, straight posterior border and subparallel cheeks. Eyes moderately large, at the middle of the sides. Mandibles 5-toothed, with convex external borders. Clypeus rather flat in the middle, with straight, transverse anterior border. Frontal area distinct, triangular. Antennae slender, scapes reaching fully $\frac{1}{2}$ their length beyond the posterior border of the head; all the funicular joints decidedly longer than broad, the first as long as the two succeeding subequal joints together, the club 4-jointed, not very distinct. Thorax shaped as in *M. manni* but somewhat shorter, with a feeble but distinct transverse dorsal impression between the meso- and epinotum, the base of the latter somewhat longer than the abrupt declivity, the spines long, but shorter than in *manni*, straight in profile, rather stout at the base and slender apically, directed backward and upward, seen from above somewhat curved inward basally and bent slightly outward at their tips. Metasternal angles rounded and not projecting. Petiolar peduncle decidedly shorter than in *manni*, not longer than the node, with feeble anteroventral tooth and slight dilatation at the spiracles. Node decidedly higher than in *manni*, higher than long, rising rather abruptly from the peduncle and evenly rounded above. Postpetiole rounded-trapezoidal, narrower in front than behind, broader than long, about $1\frac{1}{2}$ times as broad as the petiole. Gaster elongate elliptical, the first segment longer than the remaining segments together. Femora and tibiae not incrassated.

Sculpture much as in *manni*, but the rugules even coarser especially on the thorax, transverse on the anterior and longitudinal on the posterior portion of the pronotum and on the pleurae, transverse also on the mesonotum and on the base and declivity of the epinotum. Surface of head and thorax moderately shining; pedicel and gaster smooth and more shining; femora shining and sparsely tuberculate, scapes opaque.

Hairs white, much as in *manni*, but of more uneven length on the body; those on the scapes more delicate and less curved.

Head and thorax ferruginous red, with very indistinct metallic purplish reflections; mandibles, clypeus, cheeks and epinotal spines distinctly yellowish, mandibular teeth black, peduncle of petiole reddish yellow, node and postpetiole brown, gaster black, legs and antennae dark brown or blackish, femora not paler at the base.

Described from numerous workers taken by Dr. W. S. Creighton at Mina Carlota, Cumanyagua (type locality) and San Blas, near Cienfuegos, and two workers taken by Dr. J. G. Myers at Buenos Aires, Trinidad Mountains, Cuba. This species may be readily mistaken for *M. manni*, but is distinguished by the very different petiole, the feebly impressed thoracic dorsum, the shorter epinotal spines, the coarser thoracic sculpture, differently colored legs, etc. Dr. Creighton found the colonies nesting in the crevices of limestone cliffs.

MACROMISCHA SQUAMIFERA Roger

Numerous workers from the following localities in the Trinidad Mountains, Cuba: Mina Carlota (W. M. Mann, Geo. Salt), Buenos Aires (J. G. Myers) and San Blas (W. S. Creighton). These belong to the form described by Dr. Mann as the var. *atrinodis*, but both he and Dr. Creighton now believe that Roger's specimen was somewhat immature and had incompletely pigmented nodes. The variety, therefore, becomes a synonym of the typical form. According to Mann, this beautiful ant "nests in hollow twigs, sometimes in live plants but preferring small ones on the ground, in humid woods."

CROESOMYRMEX LUGENS (Roger)

Worker.—Length 5–5.5 mm.

Head suboval, fully $\frac{1}{4}$ longer than broad, produced and semicircular behind where it is narrower than at the anterior border. Eyes rather large, moderately convex, distinctly in front of the middle of the sides. Mandibles stout, with straight external borders, 5-toothed, the two apical teeth stout, the others small and rather indistinct. Clypeus convex in the middle, subcarinate, with broadly rounded, entire anterior border. Frontal area very distinct, elongate triangular, with a median carinula. Frontal carinae well developed and rather long. Antennae long and slender, the scapes reaching fully $\frac{2}{3}$ their length beyond the posterior border of the head, first funicular joint as long as the nearly equal second and third joints together, joints 2–8 subequal, about $1\frac{1}{2}$ times as long as broad, club 3-jointed, terminal shorter than the two basal joints together. Thorax long, narrower than the head, broad through the pronotum and laterally constricted behind it, mesoepinotum not longer than the pronotum. In profile the thorax is low, its dorsal outline straight in the middle, the anterior end of the pronotum feebly, the epinotum behind more strongly though

evenly rounded. Metasterna broad and rounded, somewhat projecting. Petiole fully five times as long as broad, only slightly widened behind at the node, which is decidedly shorter than the peduncle, laterally compressed and constricted behind, in profile rather low, about as long as high, broadly and evenly rounded above. The peduncle has no anteroventral tooth and is not enlarged at the spiracles. Postpetiole campanulate, convex above, as long as broad, strongly narrowed anteriorly. Gaster small, elongate-elliptical, pointed posteriorly, nearly as high as broad. Sting small. Legs long, the femora but not the tibiae distinctly incrassated.

Mandibles coarsely striated, rather shining. Head, thorax, abdomen and appendages subopaque, densely and evenly punctate, the nodes of the petiole and postpetiole and the abdomen somewhat more shining. Cheeks and clypeus loosely, longitudinally rugulose; thorax longitudinally rugose, most distinctly on the pronotum which has about sixteen regular rugae, which are coarsest on the sides.

Hairs snow white, obtuse, flattened and somewhat scalelike, abundant and covering the whole insect, erect, of even length and distribution on the body, more oblique on the legs and scapes, appressed on the funiculi and tarsi.

Black; mandibles, frontal carinae, insertions of antennae, extreme tips of antennae and terminal tarsal joints reddish brown. Gaster sometimes with bluish or aeneous reflections.

I have redescribed this singular and striking species from several specimens received from Dr. C. G. Aguayo, who is the first to recover it since it was described by Roger in 1863. He collected the specimens in crevices of a limestone cliff at Camoa, in the province of Havana, Cuba, the very locality in which Gundlach found the type. He also sent me two other series, one taken by himself in the Sierra de Anafe, Pinar del Rio, the other by Dr. Bermudez at Mena, in the Valle de Yurumi, near Matanzas.

CROESOMYRMEX PUNICANS (Roger)

I infer from Roger's description that this species, which has an unarmed epinotum and a mesoëpinotal impression apparently deeper than in *bermudezi* and *poeyi*, is a true *Croesomyrmex*. It is the largest species in the genus, measuring 7 mm., and was taken by Gundlach on the farallones of Santiago de Cuba and Monte Toro in the mountains of Guantanamo, at the extreme eastern end of the island.

I have already alluded (p. 4) to Emery's interpretation of this ant,

first as an *Aphaenogaster* and later as a worker *Pheidole*. In my opinion neither of these allocations can be sustained. Roger may be supposed to have been familiar with *Aphaenogaster* since he described several species, and no species of the genus has ever been found in the West Indies. *A. relictus* which Mann and I recorded from Haiti has proved to be a *Novomessor*. Furthermore, the length of *punicans* (7 mm.) is far too great for a *Pheidole* worker, and a completely unarmed epinotum is very rare in that huge genus. I feel confident that had Emery been familiar with such species of *Croesomymex* as *pocyi* and *bermudezi*, which have the epinotum unarmed and the thoracic dorsum distinctly concave in the middle, he would have adopted Roger's opinion in regard to the generic affinities of *punicans*.¹

CROESOMYRMEX IRIS (Roger)

Worker.—Length 4–4.5 mm.

Head rectangular, about $\frac{1}{2}$ longer than broad, as broad in front as behind, with broadly rounded posterior corners and straight posterior border. Eyes moderately large and convex, a little in front of the middle of the sides. Mandibles rather broad, with moderately convex external borders, two large apical and three smaller, irregular basal teeth. Clypeus convex behind, depressed anteriorly, with broadly rounded, medially sinuate anterior border. Frontal area distinct, elongate-triangular, continued back as a short furrow representing the anterior end of the frontal groove. Antennae slender; scapes extending about $\frac{1}{2}$ their length beyond the posterior border of the head; first funicular joint somewhat longer than 2 and 3 together, joint 2 slightly longer than 3; club 3-jointed. Thorax broadest through the pronotum, with evenly and feebly rounded dorsal outline, nearly straight in the middle. Metasterna small and rounded. Petiole about five times as long as broad, peduncle with a rudimentary anteroventral tooth, node strongly laterally compressed, as long as the peduncle, nearly as long as high, evenly rounded above and constricted behind. Postpetiole campanulate, convex above, as broad as long, about three times as broad behind as at the petiolar node. Gaster small, elongate-elliptical, pointed; sting small. Legs long, femora thin basally, strongly incrassated distally, tibiae only slightly thickened.

Mandibles striate-punctate, shining; clypeus irregularly rugulose; cheeks indistinctly striate, frontal area shining, head opaque, evenly

¹ See postscript, p. 29.

and densely punctate, the posterior corners somewhat smoother and shining. Thorax shining, longitudinally rugose, the rugae stronger on the pronotum, transverse on the epinotum but continuous on each side with the longitudinal rugae of the pleurae. Peduncle and sides of petiolar node longitudinally rugulose; the narrow upper surface of the node, the postpetiole, gaster, coxae and swollen portions of the femora very smooth and shining; the slender bases of the femora, the tibiae and antennal scapes opaque, finely punctate-striate.

Hairs glistening white, obtuse, moderately long and abundant, erect on the body, more oblique on the appendages.

Mandibles, cheeks and clypeus piceous brown; head dull metallic green or purple; thorax metallic green or cupreous; peduncle of petiole yellow, node metallic green; postpetiole metallic purple; gaster, legs and antennae very dark piceous brown or black, terminal tarsal joints brownish.

Redescribed from several workers sent me by Dr. C. G. Aguayo from three Cuban localities, namely: El Guabinacho, Rangel; San Diego de los Baños, and Subida al Rangel, all in the province of Pinar del Río. The species has not been taken since Gundlach found the type at the entrance to the Yurumi valley, near Matanzas. There is considerable variation in the metallic coloration of the head and thorax. Roger describes his specimen as having the thorax purplish violet, the femora dark metallic green or brown, the tarsi and funiculi paler brown. Santschi (1930) has very recently described a var. *nigripes* of this species from the Sierra de los Organos, Pinar del Río, with the antennae and legs, excepting the tarsi, black. Since many of my specimens have the antennal scapes and tibiae distinctly brown or black, I am inclined to regard the proposed variety as not worthy of recognition.

C. IRIS var. RUFITHORAX var. nov.

Worker.—Differing from the typical form in coloration, the head being black with only a very indistinct tinge of metallic green, the thorax yellowish red, the entire petiole reddish yellow, the former with a faint tinge of metallic green, the postpetiole black, like the gaster, legs and antennae. The tibiae are smoother and more shining, but the scapes are opaque as in the typical form.

Described from seven workers taken by Dr. C. G. Aguayo at Las Animas, Rangel (type locality), one from Subida al Rangel, and one taken by Dr. Bermudez at Rangel Arriba, all localities in the province of Pinar del Río.

C. IRIS var. *TRISTIS* var. nov.

Worker.— Closely resembling the preceding variety but with both the thorax and petiole dull, dark red, and the petiolar node infuscated. Apart from a scarcely perceptible greenish sheen on the posterior portion of the head, there is no trace of metallic coloration.

Two workers taken by G. Natanzen at Guajaebon, Pinar del Rio, and received from Dr. C. G. Aguayo.

CROESOMYRMEX AGUAYOI sp. nov.

Worker.— Length 3-3.5 mm.

Head suboval, distinctly longer than broad, the postocular portion with broadly rounded posterior corners and convex posterior border, the cheeks subparallel. Eyes moderately large and convex, near the middle of the sides. Mandibles rather broad, 5-toothed, with feebly and evenly convex external borders. Clypeus convex posteriorly, impressed in the middle anteriorly, its border broadly sinuate in the middle. Frontal area triangular, deeply impressed, with a median carinula. Antennae slender, scapes extending nearly $\frac{1}{2}$ their length beyond the posterior border of the head; first funicular joint as long as the two following joints together, the second a little longer than the third, the club distinctly 3-jointed. Thorax rather low, broadest through the pronotum, the dorsal outline evenly arched above and curving behind into the epinotum without distinct base and declivity, the meso- and epinotum rather strongly compressed laterally so that they are narrow and somewhat roof-shaped above. Metasternal angles small and bluntly rounded. Petiole short, the peduncle shorter than the node, with a distinct anteroventral tooth; node laterally compressed, in profile rising gradually from the peduncle, evenly rounded above and constricted behind. Seen from above, the node is only slightly broader than the peduncle and has a very narrow, longitudinal superior border. Postpetiole campanulate, convex above, slightly broader than long and nearly three times as broad as the petiole. Gaster broadly elliptical, with straight anterior border; sting small. Legs moderately long, femora strongly incrassated beyond their slender bases; tibiae not enlarged.

Shining throughout; the head, thorax and petiole less than the postpetiole, gaster and femora; scapes opaque and finely punctate-striate. Mandibles coarsely striate; head densely, evenly but not deeply punctate, the cheeks and inner orbits longitudinally rugulose; posterior

corners more shining and finely striated. Thorax rugose, the rugae coarse and longitudinal on the pronotum and sides, finer and more irregular on the dorsal surface of the meso- and epinotum, transverse on the epinotal declivity. Sides of petiolar node rugose, the rugae, which are less coarse than those on the thorax, radiating fanwise backward from the peduncle. Postpetiole, gaster and legs very smooth and shining, with small, sparse, piligerous punctures.

Hairs snow white, delicate, pointed, uneven, moderately numerous and erect on the body, oblique on the appendages.

Uniformly deep metallic blue; mandibles, antennae, tibiae, tarsi, trochanters and tips of femora, dark piceous brown.

Described from nine workers taken by Dr. C. G. Aguayo in the Sierra de la Guira, San Diego de los Baños, Pinar del Río, nesting in the crevices of limestone cliffs. This exquisite species resembles *C. wheeleri* Mann, but has longer and much more slender antennae, a differently shaped thorax, much more incrassated femora, a different sculpture of the head and thorax and a very different and more pronounced metallic coloration.

C. AGUAYOI var. *ARCHERI* var. nov.

Worker.—Differing from the typical form in having the head shorter, the frontal area even more distinct and the surface of the posterior half of the head smoother and more shining, owing to the obsolescence of the dense punctures of the typical form of the species.

Nine workers taken by Mr. A. F. Archer in the San Vicente Valley, Viñales, Pinar del Río, Cuba.

CROESOMYRMEX POEYI (Wheeler)

Four workers taken by Dr. C. G. Aguayo, two at Furnia, Sierra de la Guira, San Diego de los Baños, Pinar del Río, and two at Subida al Rangel, in the same province. The specimens were nesting in the crevices of limestone cliffs. Mann has redescribed and figured this peculiar species from Viñales. The antennal clubs are 3-jointed. My specimens do not measure more than 4 mm.

CROESOMYRMEX BERMUDEZI sp. nov.

Worker.—Length 4.5–5 mm.

Very closely resembling *C. poeyi* in the shape, sculpture and coloration of the body and the singular incrassation of the femora, but the clubs of the antennae are distinctly 4-jointed, the head is less narrowed

at the occiput and, instead of being smooth and shining as in *poeyi*, is opaque, densely and finely punctate and with dull green reflection. The thorax is more robust, especially in the mesoëpinotal region, more opaque, more finely rugulose and more densely punctate. The entire petiole is red as well as the thorax; the neck more or less infuscated; the dorsal impression of the thorax is slightly shallower. The petiole is five times as long as broad, parallel-sided behind the spiracles, which are prominent, the peduncle is somewhat stouter than in *poeyi* and the node rises from it less abruptly. The postpetiole is distinctly broader in proportion to its length. Erect hairs, especially on the thorax, more abundant, and those on the scapes more oblique.

Described from several workers taken by Dr. C. G. Aguayo at Las Animas, Rangel, Pinar del Rio (type locality), and by Dr. P. J. Bermudez at La Catalina and Galalón, in the same province.

C. BERMUDEZI var. MUTABILIS var. nov.

Worker.—Length 4–4.5 mm.

Differing from the typical form only in its somewhat smaller size, in having the petiole varying from dark red to black, and in lacking the greenish reflection on the head.

Seven workers from the Sierra del Paso Real, Guane, Pinar del Rio (type locality), and a single worker taken by Natanzen at Pan de Guajaibon, also in Pinar del Rio.

ANTILLAEMYRMEX ALBISPINA (Wheeler)

subsp. *pallipes* Mann.

This form, from Mona Island, off Porto Rico, was regarded by Mann as a variety, but it seems to me to be a well marked subspecies. A worker and a dealated female in my collection measure only 1.5 and 2.6 mm. respectively, whereas the worker and female of the typical *albispina* measure 2–2.5 and 4 mm. In both castes of *pallipes* the legs, antennal scapes and mandibles are yellowish white and the petiolar node is distinctly smooth and shining. The antennal funiculi are slightly brownish.

ANTILLAEMYRMEX FLORIDANUS sp. nov.

Worker.—Length 2.3–2.6 mm.

Head subrectangular, scarcely longer than broad and somewhat narrower in front than behind, with the moderately large and convex eyes at the middle of the sides; posterior border nearly straight, pos-

terior corners broadly rounded. Mandibles rather small, 5-toothed, with feebly convex external borders. Clypeus sharply carinate in the middle, with straight, entire anterior border, sinuate on each side. Frontal area triangular, impressed, rather large but indistinct. Frontal carinae short, diverging posteriorly. Antennae short; scapes stout, curved at the base, reaching to less than half the distance between the eyes and the posterior corners of the head; first funicular joint as long as joints 2-5; joints 2-8 subequal, much broader than long; club 3-jointed, very distinct, as long as the remainder of the funiculus, the large terminal joint longer than the two subequal basal joints together. Thorax short, somewhat more than twice as long as broad, broadest through the pronotum, the sides gradually converging posteriorly, the dorsal outline evenly convex and rounded; declivity of epinotum perpendicular, concave, somewhat longer than the base; spines as long as the declivity, stout basally, with tapering, acute tips, as long as their distance apart at the base, straight or slightly deflected, directed backward, outward and somewhat upward. Petiolar peduncle short and stout, only half as long as the node, with a strong, downwardly directed anteroventral tooth; node large and thick, subcuboidal in profile, its anterior slope forming an obtuse angle with the peduncle, its dorsal surface somewhat flattened, its posterior surface abrupt and nearly perpendicular. Seen from above the node is as broad as long, rounded anteriorly and laterally, and truncated posteriorly. Postpetiole large and convex, broader than the petiole, fully twice as broad as long, with rounded sides. Gaster large, formed very largely of the first segment which is subrectangular, as broad as long, with straight anterior border. Legs short, femora distinctly but not greatly incrassated in the middle; tibiae clavate.

Shining; gaster and legs more so than the remainder of the body; mandibles striate; clypeus longitudinally rugose on the sides; head, thorax, petiole and postpetiole reticulate-rugose, the two latter less sharply than the two former; gaster and legs very smooth, with small, sparse, piligerous punctures. Epinotal spines longitudinally, epinotal declivity transversely rugose.

Hairs whitish, rather numerous on the body, short, erect, bristle-like and blunt but not coarse; antennal scapes, femora and tibiae with sparse, suberect, blunt but more delicate hairs.

Brownish yellow or pale ferruginous; gaster paler; scapes, mandibles and legs still paler, ivory yellow or white, with the knees, apices of tibiae, tarsal joints and articulations of funicular joints reddish. Mandibular teeth black.

Described from numerous specimens taken from the cavities of a small branch of a tree at Paradise Key, Dade County, Florida. The behavior of this ant was so much like that of certain species of *Lepthorax* that I at first assigned it to that genus. It has all the essential characters of *Antillaemyrmex*, however, though it differs from all the described forms in its much coarser and reticulate-rugose sculpture.

Postscript

Since this paper was written, Dr. W. S. Creighton has examined the cotypes of *Macromischa punicans* Roger in the Museum of the Philadelphia Academy of Sciences and gives me the following redescription to include in this place. The insect proves to be a true *Croesomyrmex*.

CROESOMYRMEX PUNICANS (Roger)

Head (excluding the mandibles) about $\frac{1}{2}$ longer than broad, the sides feebly convex, the occipital angles much rounded, the occiput narrow and flat. Eyes small, circular or subcircular, strongly convex, and situated at the middle of the side of the head. Mandibles with two well developed apical teeth and two or three poorly developed basal teeth. Clypeus moderately projecting, broadly truncate anteriorly with a small median notch in the anterior edge. Frontal carinae narrow and parallel, not diverging behind. Antennal scapes short and stout, barely surpassing the occipital border, only slightly curved at the base, becoming steadily thicker from the base to apex. First funicular joint twice as long as broad, second joint slightly longer than broad, the remaining small joints as broad as long or broader than long, club 3-jointed, the last joint equal in length to the two preceding joints but surpassing them slightly in thickness. Greatest width of the thorax seen from above approximately $\frac{1}{2}$ of the head, the pronotum subcircular, slightly wider than the epinotum and notably wider than the mesonotum, the latter rather strongly constricted anteriorly, gradually diverging posteriorly. Promesonotal suture absent on the dorsum, obsolete on the sides. Mesoepinotal suture absent. Seen in profile the promesonotum is strongly convex above and much higher than the epinotum to which it descends posteriorly through a steep, straight declivity. Basal face of the epinotum approximately three times as long as the declivity, flat in its anterior two thirds, feebly convex in the posterior third, meeting the short declivity in a rather blunt, though well marked angle. Node of the petiole not marked off

from the peduncle, the two in profile forming a low wedge which is rounded above posteriorly. Posterior peduncle short and very thick. Postpetiole in profile larger than the petiolar node, the dorsum feebly convex anteriorly, more strongly convex behind. Seen from above, the node of the petiole is longitudinally oval, of equal length with the peduncle, with a pair of prominent lateral stigmatic tubercles at their point of junction. Postpetiole from above with a rectangular node and a triangular peduncle, the node very little broader than that of the petiole. Abdomen elongate, elliptical. Femora strongly but evenly incrassated.

Mandibles entirely covered with fine and rather regular striae, with a few sparse interspersed punctures. Cephalic striae coarser but even more regular, slightly diverging on the occiput. Median portion of the clypeus longitudinally striate. The entire head shining. The whole thorax granulose and opaque as is also the peduncle of the petiole; the node of the petiole and the postpetiole irregularly rugose and feebly shining. Abdomen smooth and moderately shining with minute piligerous punctures.

Hairs on the head, thorax and petiolar nodes rather sparse, erect, golden. Those on the scapes, funiculi and tarsi shorter, whiter and much more numerous. Abdomen, femora and tibiae with short but somewhat sparse hairs.

Head and thorax clear red, legs reddish brown, antennae and abdomen piceous brown. The whole insect, particularly the antennae and abdomen, with faint violaceous reflections in certain lights.

Redescribed from two specimens in the Poey collection of the Philadelphia Academy of Natural Sciences. The locality label is simply "Cuba."

LEPTOTHORAX SCULPTIVENTRIS Mayr.

This rare ant deserves consideration in connection with the genus *Macromischa*, to which one might be inclined to assign it. Mayr described it in 1887 from a worker specimen taken in the province of Santa Catharina, Brazil, and placed it with some misgiving in the genus *Leptothorax*. In 1899 Forel described a form of it as var. *major* from a specimen taken in São Paulo. He seems to have had no doubt about its being a *Leptothorax*. Emery, in the "Genera Insectorum" (1921), placed the two forms in his section of the subgenus *Goniothorax* of *Leptothorax*, with 12-jointed antennae. Several years ago Father T. Borgmeier sent me from Petropolis, Brazil, a specimen which I identified as *L. sculptiventris* but which is evidently a distinct variety that

may be called *borgmeieri* var. nov. It measures fully 4.5 mm. and is, therefore, as large as the var. *major*, but differs from this and the typical form in the coloration of the legs since the tips of the coxae, the trochanters, the bases of the femora and tibiae are yellow, while the remainder of the femora and tibiae are black and the tarsi red. The second to sixth funicular joints are as broad as long, as in the type. The prothorax has a very feeble but distinct tooth at each humeral angle, indicating relationship with *Goniothorax*. The legs are long and the femora, especially the hind pair, strongly thickened in the middle. The stature, highly differentiated coloration and general habitus of this variety are those of a *Macromischa* with a short petiolar peduncle, but the pronotal angles, the spines on the peduncle, the shape of the postpetiole and the pilosity are those of a *Goniothorax*. I am inclined, therefore, to adopt Emery's allocation of *L. sculptiventris*, at least till it is better known.

Known Species of the Three Genera

MACROMISCHA (Roger) Mann emend.

<i>allardycei</i> Mann (1920) ♀	Bahamas
<i>affinis</i> Mann (1920) ♀	Cuba
<i>androsana</i> Wheeler (1905) ♀	Bahamas
<i>annectens</i> sp. nov. ♀	Mexico
<i>azteca</i> sp. nov. ♀ ♂	Mexico
<i>bruneri</i> Mann (1924) ♀	Cuba
<i>creightoni</i> Mann (1929) ♀	Cuba (Isle of Pines)
<i>flavitaris</i> Mann (1920) ♀ ♂	Guatemala
<i>fuscata</i> Mann (1920) ♀	Guatemala
<i>isabellae</i> Wheeler (1908) ♀ ♂	Porto Rico
<i>laevissima</i> Wheeler (1911) ♀	Mexico
<i>lucayensis</i> Forel (1901) ♀	Bahamas
<i>manni</i> sp. nov. ♀	Cuba
<i>melanocephala</i> sp. nov. ♀	Cuba
<i>myersi</i> sp. nov. ♀	Cuba
<i>pastinifera</i> Emery (1894) ♀ ♂	Bahamas, Cuba
var. <i>opacipes</i> Wheeler (1905) ♀	Bahamas
<i>petiolatus</i> (Forel) (1901) ♀	Mexico
<i>porphyritis</i> Roger (1863) ♀	Cuba
var. <i>latispina</i> var. nov. ♀	Cuba
var. <i>jaumei</i> Santschi ♀	Cuba

<i>purpurata</i> Roger (1863) ♀ ♀	Cuba
<i>sallei</i> (Guérin) ♀ ♀ ♂	Santo Domingo
subsp. <i>haytiana</i> Wheeler & Mann (1914) ♀ ♀ ♂	Haiti
subsp. <i>opacinoda</i> subsp. nov. ♀	Haiti
<i>salvini</i> Forel (1899-1900) ♀	Panama
var. <i>obscurior</i> Forel ♀	Panama
<i>scabripes</i> Mann (1920) ♀	Cuba
<i>schwarzi</i> Mann (1920) ♀	Cuba
<i>skwarrae</i> sp. nov. ♀ ♀	Mexico
<i>splendens</i> Wheeler (1905) ♀ ♀ ♂	Bahamas
<i>squamifera</i> Roger (1863) ♀	Cuba
<i>subditiva</i> Wheeler (1903) ♀ ♀	Texas
<i>violacea</i> Mann (1924) ♀	Cuba

CROESOMYRMEX Mann

<i>aguayoi</i> sp. nov. ♀	Cuba
var. <i>archeri</i> var. nov. ♀	Cuba
<i>bermudezi</i> sp. nov. ♀	Cuba
var. <i>mutabilis</i> var. nov. ♀	Cuba
<i>gundlachi</i> (Wheeler) (1913) ♀	Cuba
<i>iris</i> (Roger) (1863) ♀	Cuba
var. <i>rufithorax</i> var. nov. ♀	Cuba
var. <i>tristis</i> var. nov. ♀	Cuba
<i>lugens</i> (Roger) (1863) ♀	Cuba
<i>poeyi</i> (Wheeler) (1913) ♀	Cuba
<i>punicans</i> (Roger) (1863) ♀	Cuba
<i>versicolor</i> (Roger) (1863) ♀ ♀	Cuba (Isle of Pines)
<i>wheeleri</i> Mann (1920) ♀ ♀	Cuba

ANTILLAEMYRMEX Mann

<i>albispina</i> (Wheeler) (1908) ♀ ♀	Culebra and
subsp. <i>pallipes</i> Mann (1920) ♀ ♀	Mona Isl. near Porto Rico
<i>ciferrii</i> Menozzi (1930) ♀	Santo Domingo
<i>flavidulus</i> Wheeler & Mann (1914) ♀	Haiti
<i>floridanus</i> sp. nov. ♀	Florida
<i>pulchellus</i> Emery (1894) ♀ ♀	St. Thomas
<i>terricola</i> Mann (1920) ♀ ♀	Cuba

BIBLIOGRAPHY

ANDRÉ, ERNEST

1887. Description de quelques fourmis nouvelles ou imparfaitement connues. *Rev. d'Ent.*, pp. 280-298.

EMERY, C.

1894. Studi sulle formiche della Fauna Neotropica. *Bull. Soc. Ent. Ital.*, **26**, pp. 137-241, 4 pls.
 1896. Sur les fourmis du genre *Macromischa* Rog. *Bull. Soc. Ent. France*, pp. 102-103.
 1915. Definizione del genere *Aphaenogaster* e partizione di esso in sottogeneri. *Rend. R. Accad. Sc. Bologna*, **19**, pp. 67-75.
 1921. Myrmicinae in Wytsman's "Genera Insectorum," pp. 245-247.

FOREL, A.

- 1899-1900. Formicidae in Salvin and Godman's "Biologia Centrali-Americana". Vol. III.
 1900. Nids du *Camponotus senex* Sm. et de la *Macromischa sallei* Guérin. *Bull. Soc. Ent. Suisse*, **10**, pp. 271-272.
 1901. Fourmis Mexicaines récoltées par M. le professeur W. M. Wheeler. *Ann. Soc. Ent. Belg.*, **45**, pp. 123-136.
 1901. Variétés Myrmécologiques. *Ann. Soc. Ent. Belg.*, **45**, pp. 334-382, 2 figs.

GUÉRIN-MÉNEVILLE, F. E.

1852. Notice sur une nouvelle espèce de Fourmi découverte à Saint-Dominique par M. Auguste Sallé, et qui fait son nid dans des plaines marécageuses, sur les buissons. *Rev. et Mag. Zool.* (2), **4**, pp. 75-79, 1 pl.

MANN, W. M.

1920. Additions to the ant fauna of the West Indies and Central America. *Bull. Amer. Mus. Nat. Hist.*, **42**, pp. 403-439, 10 figs.
 1929. Notes on Cuban ants of the genus *Macromischa*. *Proc. Ent. Soc., Washington*, **31**, pp. 161-166, 3 figs.

MAYR, G.

1868. Die Ameisen des baltischen Bernsteins. *Beitr. Naturk. Preussens, physik-ökonom. Gesell. Königsberg*, I., 102 pp., 5 pls.

MENOZZI, C. AND RUSSO, G.

1930. Contributo alla conoscenza delle Mirmecofauna della Repubblica Dominicana (Antille). *Boll. Lab. Zool. Gen. Agrar. Portici*, **24**, pp. 148-173, 6 figs., 4 pls.

ROGER, J.

1863. Die neuaufgeführten Gattungen und Arten meines Formiciden-Verzeichnisses. Berlin Ent. Zeitschr., pp. 131-214.

SANTSCHI, F.

1909. *Leptothorax rottenbergi* et espèces voisines. Rev. Suisse Zool., **17**, pp. 459-482, 10 figs.
1924. Descriptions de nouveaux Formicides africaines et notes diverses. II. Rev. Zool. Afric., **12**, pp. 195-224, 10 figs.
1930. Quelques Fourmis de Cuba et du Brésil. Bull. Soc. Roy. Entom. d'Égypte, n. sér., pp. 75-83.

WHEELER, W. M.

1901. Notes on Mexican ants. Ann. Soc. Ent. Belg., **45**, pp. 199-205.
1903. A decade of Texan Formicidae. Psyche, **10**, pp. 93-111, 10 figs.
1905. The ants of the Bahamas, with a list of the known West Indian species. Bull. Amer. Mus. Nat. Hist., **21**, pp. 79-135, 20 figs.
1908. The ants of Porto Rico and the Virgin Islands. Bull. Amer. Mus. Nat. Hist., **24**, pp. 117-170, 2 pls.
1911. Three new ants from Mexico and Central America. Psyche, **18**, pp. 203-208.
1914. The ants of the Baltic Amber. Schrift. physik. ökonom. Gesell. Königsberg, **55**, pp. 1-142, 66 figs.

WHEELER, W. M. AND MANN, W. M.

1914. The ants of Haiti. Bull. Amer. Mus. Nat. Hist., **33**, pp. 1-61, 27 figs.